Paternal Depression in the Postnatal Period and Early Father-Infant Interactions

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SYNOPSIS

***Objective*.** Paternal depressive disorder is associated with adverse effects on child development. One possible mechanism for this is through the effects of the disorder on parenting capacities. We investigated the link between paternal depression and father-infant interactions at 3 months postpartum. ***Design*.** Major Depressive Disorder was assessed in *N*=192 fathers using a structured clinical interview. Altogether, 54 fathers met criteria for depression, and 99 fathers were categorized as non-depressed. Observational assessments of face-to-face father-infant interactions were conducted in an infant-seat setting and a floor-mat setting. Associations between paternal depression and father-infant interactions were analysed using multiple linear regression adjusted for father's age, education and maternal depression. ***Results*.** Paternal depression is associated with more withdrawn parental behavior in interactions on the floor-mat. There were few other differences in observed interaction between depressed and non-depressed fathers. ***Conclusions*.** Fathers with depression may be more withdrawn, displaying less verbal and behavioral stimulation during interactions with their young infants. They may initiate a pattern of parenting that remains compromised, potentially affecting their children's development.

INTRODUCTION

Depression frequently affects both parents in the postnatal period. Most research has focussed on maternal postnatal depression and its potential impact on children's development (Field, 2010). However, meta-analytic evidence suggests that depression is also common in fathers, with a prevalence of approximately 5% for diagnosed major depressive disorder (Paulson & Bazemore, 2010). Children whose fathers are depressed in the postnatal period are at increased risk of adverse psychosocial development (Carro, Grant, Gotlib, & Compass, 1993; Paulson, Keefe, & Leiferman, 2009; Ramchandani et al., 2008). While a number of potential pathways exist by which parental depression may affect children's development, evidence suggests that parenting capacities, for example, sensitivity and responsiveness are important and also modifiable (Lawrence, Davies, & Ramchandani, 2012).

Previous empirical research supports an association between paternal depression and parenting impairment for a review see (for a review see, Wilson & Durbin, 2010). However, very few studies have examined father-infant interactions in the early months after birth, when key and potentially enduring patterns of interaction can become established. McElwain and colleagues found that depressed fathers were less intrusive (uninvolved) during free-play with their 12-month olds (McElwain & Volling, 1999). Similarly, depressed fathers (compared to non-depressed fathers) are less likely to engage in reading to their 1-year-old infants (Davis, Davis, Freed, & Clark, 2011), and demonstrate decreased tactile and vocal stimulation with their 2.5- to 4-month-old infants (Zaslow, Pedersen, Cain, Suwalsky, & Kramer, 1985). Although these studies suggest that paternal depression reduces the amount of engagement with infants, others have failed to confirm this association (Field, Hossain, & Malphurs, 1999; Lundy, 2002). Many of these studies (Davis et al., 2011; Edhborg, Matthiesen, Lundh, & Widstrom, 2005; Paulson, Dauber, & Leiferman, 2006) are subject to

important methodological limitations, most notably the use of self-report measures of both depressive symptoms and parenting, leading to the potential for "shared-method inflation."

The present study aimed to investigate the link between paternal major depressive disorder and the quality of father-infant interactions at 3-months postpartum, using an interview assessment of depression and an observed measure of parenting in two interactive settings. The focus of this study on early infancy is critical given that this is a period of rapid development and high susceptibility (Knudsen, 1999) when the infant's primary source of interaction and communication is with their parents.

METHOD

Participant Recruitment and Screening

The current report comprises data from a prospective cohort study of fathers and their families. Fathers were recruited from postnatal wards of two hospitals in the UK and met the following eligibility criteria: Fathers were aged 18 years or older at the time of the child's birth and spoke sufficient English to complete all assessments; infants had been born at no less than 37 weeks, had a birth weight of at least 2.5 kg, and did not have any severe illness or abnormality. All parents who consented were sent the Edinburgh Postnatal Depression Scale (EPDS, Cox, Holden, & Sagovsky, 1987) seven weeks after the birth of their child – 1562/4107 (38.0%) were returned. We attempted to contact all fathers scoring 10 or above on the EPDS, and a 1 in 4 random sample of fathers scoring less than 10. Those agreeing to participate were visited at home; N=192 fathers agreed to participate.

Fathers had a mean age of 35.04 years (*SD* = 5.9), and the mean age of infants was 14.37 weeks (*SD* = 2.28). All but one set of parents were either married and/or living together as a couple. The majority of fathers (92%) were European. There was some evidence that

fathers in the depressed group were slightly older than those in the non-depressed group. See Table 1 for background characteristics of the sample.

Procedure

A home-based assessment took place when the child was 3-months old. Fathers were interviewed with the Structured Clinical Interview for DSM-IV Axis 1 Disorders (First, Gibbon, Spitzer, & Williams, 2002) to assess whether they met criteria for Major Depressive Disorder. Altogether, 54 fathers met criteria for depression, and 99 fathers were categorized as non-depressed. A further 39 fathers who had high scores on the EPDS, but did not meet diagnostic criteria for depression, were not included in these group comparisons.

Observations of father-infant interactions were videotaped during two 3-min sessions of face-to- face play; one with the standard interaction with the infant placed in an infant-seat, and the other with the infant on a floor-mat the father sitting facing the infant. The latter setting was introduced after pilot work suggested this setting would help capture the more physical and stimulating aspects of interactions that fathers are more likely to engage in, and also provide a context in which fathers might ”behave in accord with depressive symptomatology, namely to withdraw from interaction with the infant” (McElwain & Volling, 1999, p. 79). Fathers were instructed to play with and talk to their infant as they would normally, but without using any toys or objects. Data on both exposure and outcome were available for a maximum of 183 fathers in the infant-seat setting and 178 fathers in the floor-mat setting.

Paternal Depression

The *Edinburgh Postnatal Depression Scale* (EPDS, Cox et al., 1987) is a 10-item self-report scale, assessing the symptoms of depression. The EPDS has been validated in men (Matthey, Barnett, & Kavanagh, 2001).

The *Structured Clinical Interview* (SCID; First et al., 2002) for DSM-IV Axis 1 Disorders was used to make the DSM-IV diagnosis for Major Depressive Disorder. The SCID has high reliability and validity (Basco et al., 2000).

Observations of Father-Infant interactions

The *Global Rating Scales* (GRS; Murray, Fiori-Cowley, Hooper, & Cooper, 1996) were used to code interactions. It has well-established psychometric properties with good discriminant validity (Gunning, Murray, & Lawson, 2002).Interactions were rated by two trained coders blind to paternal diagnostic status. The coding scheme comprised rating behaviors on a series of 5-point scales (1-5) with lower scores indicating inadequate interactions. The following dimensions of paternal interaction were measured: (1) Sensitivity: paternal response to the infant's communication cues in a way that is appropriate to the infant's needs and experiences, including attitude and feelings towards the infant; (2) Intrusiveness: over-stimulating vocal and physical activity around the infant, cutting across his/her communication, using body games, tactile stimulation, and unpredictable, arousing vocalizations; (3) Remoteness: withdrawal and disengagement manifested verbally, psychologically, and physically; and (4) Depressive affect: affective state and level of enjoyment in interacting with the infant, including anxious, vocal and physical activity. For clarity of interpretation the direction of scores on this scale were reversed - higher scores indicating increased depressive affect.

A randomly selected 20% of interactions were independently coded by pairs of coders for inter-rater agreement. Inter-rater intra-class correlations (*ICC*; Shrout & Fleiss, 1979)

ranged from .74 to .88. Discrepancies between raters were discussed, and final ratings were determined in collaboration with members of the Winnicott Research Unit who were involved in the development of the scale.

Covariates

Potential covariates were assessed including father's age and education and maternal depressive symptoms (EPDS scores). However, none of these was significantly associated with the outcome measures and so were not included in subsequent analyses.

Analytic Strategy

Analyses were conducted separately for the infant-seat and floor-mat settings. We analyzed, (1) a continuous measure of current depressive symptoms in fathers (EPDS), and (2) diagnosed depressed (n=54) and non-depressed (n=99) fathers (SCID). Use of a continuous measure of current depressive symptoms is supported by evidence suggesting that sub-threshold levels of depression are often of clinical importance (Karsten et al., 2011).

Bivariate associations were examined using Pearson correlations (with continuous EPDS scores), and mean differences and independent t-tests (for SCID diagnostic groups). As none of the covariates was associated with the outcome measure we did not conduct multiple linear regression analyses.

RESULTS

Description of Exposure and Outcome Variables

Fifty-four fathers met the SCID criteria for depression (19 with current depression, and 35 with a history of depression). Fathers with depression scored significantly higher on the EPDS (M = 14.79, SD = 3.41) than non-depressed fathers (M = 6.64, SD = 4.40), U = 258.00,

$p < 0.001$. Descriptive analyses for the whole sample on the dimensions in the floor-mat interaction setting are presented in Table 2 together with comparative analyses between the depressed and non-depressed groups. In both father-infant interaction settings, increased depressive affect was associated with more insensitive (infant-seat: $r(182) = -.30$, $p < .01$; floor-mat: $r(177) = -.32$, $p < .01$) and remote (infant-seat: $r(182) = -.55$, $p < .01$; floor-mat: $r(177) = -.56$, $p < .01$) interactions. More sensitive fathers were less intrusive in both interaction settings (infant-seat: $r(182) = .33$, $p < .01$; floor-mat: $r(177) = .41$, $p < .01$). However, more remote fathers were only less intrusive, ($r(177) = .26$, $p < .01$) in the floor-mat session.

Association between Depressive Symptoms (EPDS scores) and Father-Infant Interaction

In the *infant-seat setting* paternal depressive scores were not associated with any of the father-infant interaction dimensions.

In the *floor-mat setting* fathers with increased depressive symptoms (high EPDS scores) were less intrusive (higher scores), $r(176) = .15$, $p = .043$. EPDS scores were positively associated with the expression of depressive affect, albeit weakly, $r(176) = .15$, $p = .053$, implying that high EPDS scorers displayed increased negative affect in their interactions. There was no evidence of an association between EPDS scores and paternal remoteness and sensitivity.

Association between Major Depressive Disorder (SCID) and Father-Infant Interaction

In the *infant-seat setting* diagnosed depression was not associated with any of the father-infant interaction dimensions and hence detailed results are not reported.

In the *floor-mat setting* there was no significant difference between the depressed and non-depressed groups on paternal sensitivity, remoteness or depressive affect (see Table 2).

There was, however, a marginally significant difference between the groups on paternal intrusiveness, $t(141) = -1.98$, $p = .050$, with depressed fathers showing less intrusion, that is using less vocal and physical stimulation than non - depressed fathers . Since none of the covariates was associated with intrusiveness multiple linear regression analysis is not reported.

DISCUSSION

This study is, to our knowledge, the first to examine the association between diagnosed paternal depression in the postnatal period and specific dimensions of observed father-infant interaction. Although no group differences on paternal sensitivity were found, some evidence emerged for more withdrawn behavior from depressed fathers during interaction with their infants.

There are a number of strengths and limitations of the current study to consider. A major strength is the inclusion of blind-coded, direct observations of fathers, rather than relying on self-report or mothers as the source of information about father's behavior. This is the first study of father-infant interaction to include a clinical interview assessment of major depressive disorder. A number of limitations must also be considered. First, a relatively modest number of fathers with current depression were recruited, despite significant efforts at recruitment. Second, although the sample was recruited from universally provided clinical services the ethnic and socioeconomic composition of the participants may limit generalizability of the findings to other groups. Third, like much previous research, we used a measure of parent-child interaction that had been developed for mothers (Shannon, Tamis-LeMonda, London, & Cabrera, 2002). This choice can limit what is assessed in fathers, potentially missing the importance of stimulating interactions that are more characteristic of fathers (Lamb, 1977).

Previous research on the association between paternal depression and father-infant interaction has been relatively inconsistent (McElwain & Volling, 1999; Paulson et al., 2006; Zaslow et al., 1985), and the findings of the present study were also mixed. No differences were found on measures of parental sensitivity, whereas we found that fathers with depression were less intrusive, or more withdrawn, in their interactions but only in the floor-mat setting. Such an association between depressed mood and less involved parenting is consistent with previous research and emphasizes the importance of assessing parenting in different contexts (McElwain & Volling, 1999; Paulson et al., 2006; Zaslow et al., 1985). It is likely that the free-play session allowed depressive behaviors to emerge, leading to parental withdrawal, whereas the infant-seat setting required greater involvement from the parent; which is of concern, since young children in particular need the active involvement of a caring adult for their cognitive and socioemotional developmental needs to be met. However, it should be noted that the magnitude of the differences between depressed and non-depressed fathers was not large.

The results extend previous research in two key ways. First, they suggest that father-infant interactions may in some cases be a potential pathway by which parental depression affects children's development from a very young age. Father-child interactions are potentially amenable to intervention (Lawrence et al., 2012), and therefore represent an important preventive opportunity. Second, the findings highlight the importance of considering father-infant interactions, both in their similarities to mother-infant interactions, but also how they may differ (Tamis-LeMonda, 2004). An understanding of these differences may enable researchers to better understand the complementary roles of parents within the family system and progress towards a more comprehensive theory of parenting.

IMPLICATIONS FOR PRACTICE, APPLICATION, AND POLICY

The findings of the present study suggest that depression in fathers during the postnatal period may be associated with withdrawn father-infant interactions. They highlight the importance of the early postpartum months for the development of the father-infant relationship, and indicate the need, not only for interventions designed to alleviate depression in new fathers, but also to help improve the quality of interpersonal communication between fathers and their infants. An understanding of the nature of difficulties in father - infant interactions in the context of postnatal depression is important because of their possible implications for the longer-term development of the child. Therefore, it is important that clinicians are aware of the risk of depression in new fathers and the possible risks to the developing infant.

ADDRESSES AND AFFILIATIONS

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TABLE 1

Paternal and Infant Demographic Characteristics

Demographic details	Total[a]		Depressed[b]		Non-Depressed[b]			
	N=192		*n*=54		*n*=99			
	M	*SD*	*M*	*SD*	*M*	*SD*	*t*	*p*
Father's age (Years)	34.99	5.9	36.20	5.34	34.47	6.13	-1.75	.083
Infant's age (Weeks)	14.51	3.04	14.76	2.78	14.17	1.96	-1.36	.179
	%		*%*		*%*		χ^2	*p*
Father's education level							4.71	.194
GCSC's/A 'levels	20.8		22.6		24.2			
Diploma	15.6		41.5		15.8			
Degree	32.3		13.2		25.3			
Postgraduate degree	28.1		22.6		34.7			
Marital status							.55	.46
Single	.6		-		1			
Married/Living together	99.4		98.1		97			
Father's ethnicity							2.04	.154
White	92		97.3		87.9			
Non-white	5.6		1.9		7.1			
Infant gender							2.66	.103
Female	52.6		40.7		54.5			
Male	47.4		59.3		45.5			
Infant's birth order *(%)*							5.27	.153
1st born	59.4		48.1		64.6			
2nd born	31.8		40.7		26.3			
3rd born	7.3		7.4		8.1			

4th born	1.6	3.7	1.0

Note. [a] Sample used for the analysis of depression scores on the EPDS. [b]Sample for group analyses using the SCID.

TABLE 2

Father-infant interactions: Whole group descriptive statistics and comparisons between depressed and non-depressed groups[a]

Interaction dimensions (Floor-mat)	Whole Sample		Depressed	Non-Depressed		
	M *SD*	Median	*M*[b] *SD*	*M*[b] *SD*	*t*	*p*
			n=54*	*n*=99*		
Sensitivity	3.70 (.55)	3.8	3.67 (.54)	3.68 (.54)	.06	.955
Intrusiveness[c]	3.71 (.80)	4.0	3.84 (.65)	3.58 (.90)	-1.98	.050
Remoteness	4.59 (.80)	5.0	4.50 (.93)	4.60 (.75)	.70	.459
Depressive affect	4.02 (.53)	4.0	4.00 (.57)	4.03 (.53)	.44	.658

Note. [a] Major depressive disorder assessed using the SCID. [b] GRS scored on a scale of 1-5. [c] Higher scores indicate less stimulating interactions.
*there was missing parent-child interaction data for 4 depressed and 6 non-depressed fathers.